DATAMATION

NOVEMBER 15, 1987
A CAHNERS PUBLICATION

THE ANNUAL MINI/MICRO SURVEY

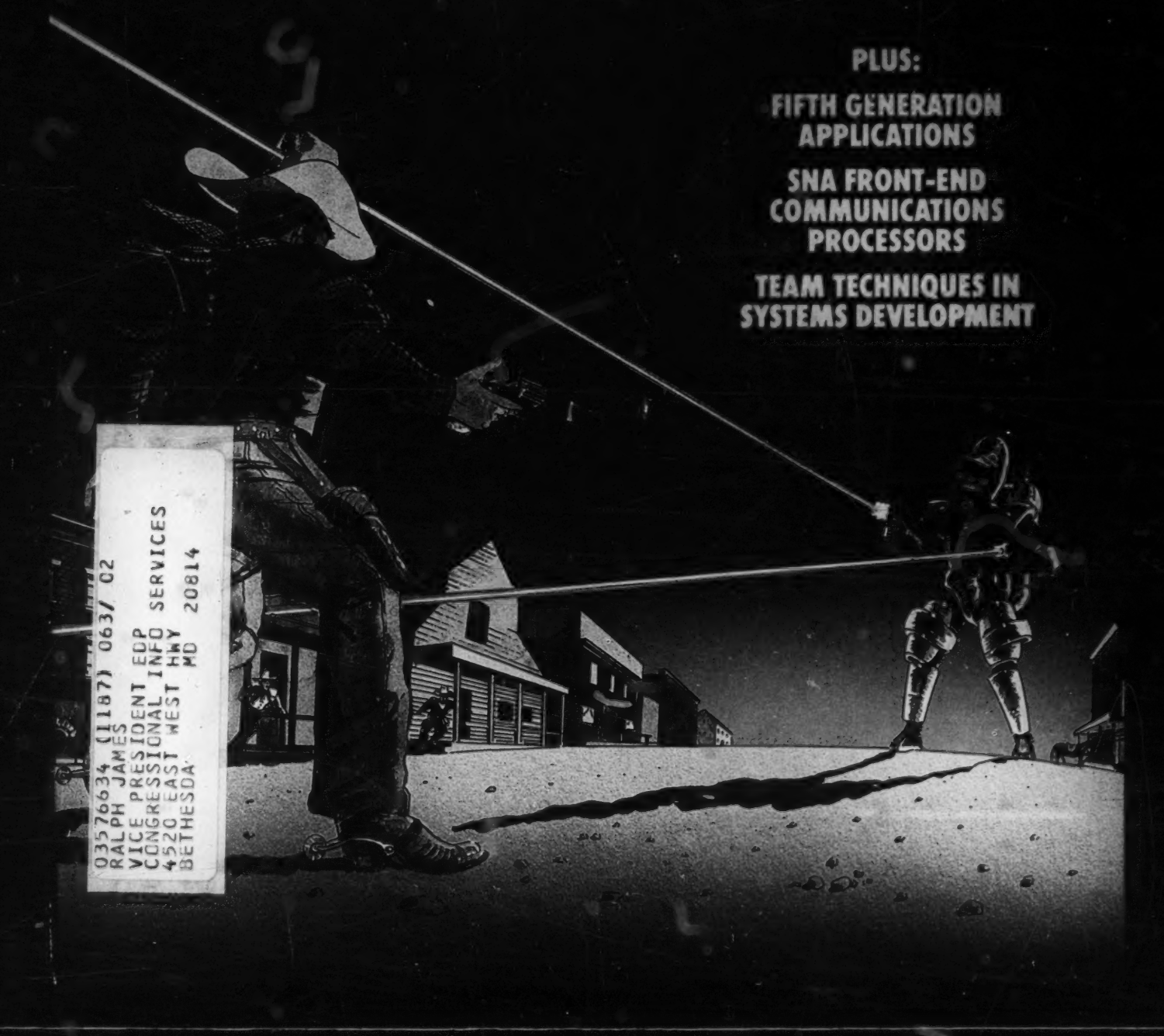
Midrange Shootout: Minis vs. Pcs and Workstations

PLUS:

FIFTH GENERATION APPLICATIONS

SNA FRONT-END COMMUNICATIONS PROCESSORS

TEAM TECHNIQUES IN SYSTEMS DEVELOPMENT



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DATAMAT

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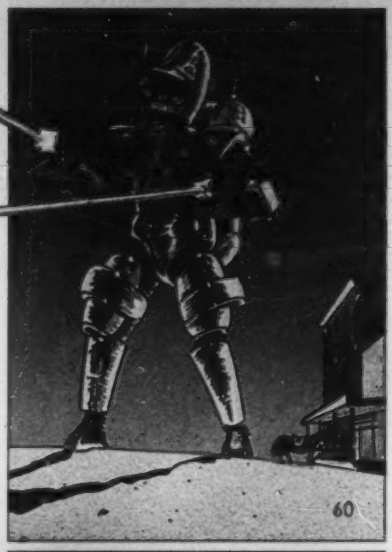
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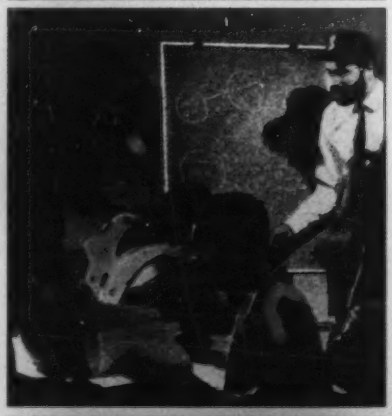

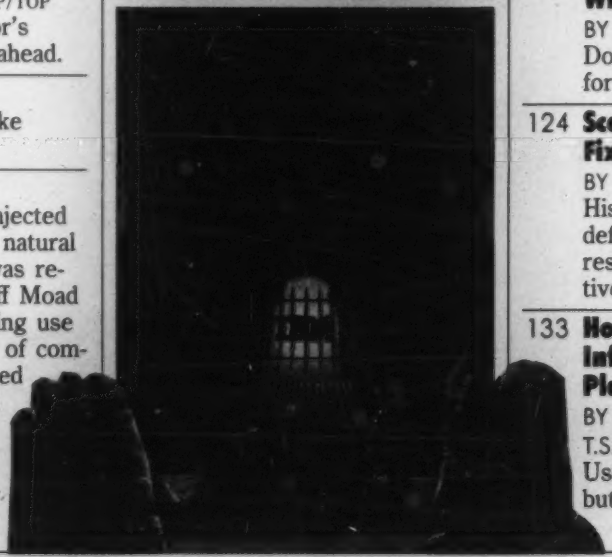

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Cover Illustration by Andreas Baruffi

NOVEMBER 15, 1987
VOLUME 33
NUMBER 22
THIS ISSUE, 185,640 COPIES

1987 JESSE H. NEAL AWARD

Editorial

Don't Jump Ship

Clearly, end-user organizations have overcome the indigestion problems that have plagued the computer industry in the past year and a half, if the results of the 1987-88 DATAMATION/Cowen & Co. Institutional Services mini/micro computer survey (p. 60) are anywhere near as accurate as the 10 previous surveys have been. Manufacturers and service companies intend to spend 14% more on minicomputers and 23% more on personal computers in the year ahead—a purchasing outlook that is far more aggressive than the one expressed a year ago.

A number of vendors also seem to have set out on the road to recovery, having streamlined their operations and having focused on customer needs. Pitches by executives from AT&T, Cullinet, Data General, and other information technology suppliers at last month's DATAMATION/Cowen & Co. conference resounded with an air of confidence that has been unheard of in recent years—except, of course, at Digital Equipment Corp. press conferences.

It's uncertain, however, whether such vendors have progressed far enough to make a difference in customers' eyes. The percentage of end users that are considering switching vendors has reached a five-year high of 16.5%. More than half the users of Datapoint, Four-Phase (Motorola), and Modcomp equipment are considering shopping elsewhere. Concurrent, Gould, and Honeywell customers are growing more restless. And the number of AT&T minicomputer sites considering a switch has nearly doubled in a year.

The beneficiaries of their discontent are established giants, notably IBM and DEC, along with relatively young companies such as Sun Microsystems and Apollo in workstations, Stratus and Tandem in OLTP applications, and Compaq in pcs.

We can't fault end users for wishing to standardize their applications on enduring architectures such as DEC's VAX design, nor can we criticize them for beating a path to the door of better mousetrap makers such as Sun and Apollo. We do, however, question whether some customers are jumping ship too hastily.

Customers shouldn't lose faith in their traditional vendors just because the vendors have suffered one bad financial year, particularly if those vendors have served them well in the past. Instead, customers should listen to what those vendors have to say and consider what they have to offer. After all, competition improves price/performance more than any other single factor.

Tim Mead

TIM MEAD
EDITOR-IN-CHIEF

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DATAMATION (ISSN 0011-6963) Magazine is issued twice monthly on the 1st and 15th of every month by The Cahners Publishing Company, A Division of Reed Publishing USA, 275 Washington St., Newton, MA 02158-1630. William M. Platt, President; Terrence M. McDermott, Executive Vice President; Frank J. Sibley, Group Vice President; Jerry D. Neth, Vice President/Publishing Operations; J.J. Walsh, Financial Vice President/Magazine Division; Thomas J. Dellamaria, Vice President/Production and Manufacturing. Editorial and advertising offices, 249 W. 17 St., New York, NY 10011. Published at Woodstock, Il. Annual subscription rates: U.S. and possessions: $55; Canada: $75; Japan, Australia, New Zealand: $145 air freight; Europe: $130 air freight, $235 air mail. All other countries: $130 surface, $235 air mail. Reduced rate for qualified U.S. students, public and school libraries: $40. Single copy: $3 in U.S. Sole agent for all subscriptions outside U.S. and Canada is J.B. Tratsart Ltd., 154 A Greenford Rd., Harrow, Middlesex HA13QT, England, (01) 422-8295 or 422-2456. No subscription agency is authorized by us to solicit or take orders for subscriptions. Second-class postage paid at Denver, CO 80206 and at additional mailing office. DATAMATION copyright 1987 by Reed Publishing USA; Saul Goldweitz, Chairman; Ronald G. Segel, President and Chief Executive Officer; Robert L. Krakoff, Executive Vice President. All rights reserved. DATAMATION is a registered trademark of Cahners Publishing Co. Reprints of articles are available; contact Frank Pruzina (312) 635-8800. Microfilm copies of DATAMATION may be obtained from University Microfilms, A Xerox Company, 300 N. Zeeb Rd., Ann Arbor, MI 48106. Printed by Graftek Press Inc. **All inquiries and requests for change of address should be accompanied by mailing label from latest issue of magazine.** Allow two months for change to be made. POSTMASTER: send address changes to DATAMATION, 44 Cook St., Denver, CO 80206.

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Letters

Cheers

We received the Sept. 15th issue of DATAMATION this morning and were intrigued by the thickness, then noticed the 30th Anniversary cover and were lured immediately into the center pages. We especially enjoyed your "Hall of Fame," "Three Decades of DATAMATION Cartoons," and "A Day in Your Life Without Computers." With just this quick look, it is definitely a keeper!

Congratulations on your 30th! Most important, however, is a hearty, "Good job, well done!" on this issue.

KEN & BJ ANDERSON
The Anderson Report
Anderson Publishing Company
Simi Valley, Calif.

My sincere compliments for the superb 30th Anniversary issue. It was extremely gratifying to see "The DATAMATION Hall of Fame" (p. 56), particularly four persons with whom I had business contacts while with Remington Rand Univac many, many years ago: J. Presper Eckert, Grace M. Hopper, John X. Mauchly, and William F. Norris.

GEORGE SOTER
Connecticut State Labor Department
Wethersfield, Conn.

Jeers

Jeers for omitting Steve Jobs from your "Hall of Fame." Steve Wozniak certainly belongs in any such Hall, but to omit Steve Jobs seems a deliberate and silly slap in the face. Jobs is the man behind the Mac, and should automatically have been included in your "Hall of Fame."

PAUL WILFONG
Verac Inc.
San Diego

While I enjoyed your 30th anniversary issue, I was astonished at the absence of John Vincent Atanasoff from your "DATAMATION Hall of Fame." He built a device in 1939 that incorporated binary logic, regenerative memory, and even vector processing, and was visited in the 1940s by an interested John Mauchly, who I notice did make your Hall.

ED PRIOR
Poquoson, Va.

I was extremely disappointed to note the absence of John Vincent Atanasoff from your initial list of 30 honorees in "The DATAMATION Hall of Fame."

Having given credit (and much certainly is due) to Messrs. Eckert and Mauchly, we should not jade history by ignoring the work Atanasoff and his graduate student Clifford Berry accomplished in the years 1936 through 1939.

ROGER S. GOURD
MASSCOMP
Westford, Mass.

Unhistoric?

Bruce J. Schulman's review (August 15, p. 124) of my book, *The New Capitalism*, seems a bit unhistoric coming from a historian. Although he astutely notes the enormous barriers to modernizing our economy for an information age, he neglects the powerful forces that are relentlessly driving this transition on. The New Capitalism is evolving now—not out of enlightened ideas, good intentions, or even sound planning—but because an explosion of information technology exerts new imperatives that are forcing big business in this direction.

Numerous studies, economic data, examples, authoritative opinion, and other evidence show that the New Capitalism is fairly well defined, although it is as yet in an early state of development and limited to leading-edge companies. There are now about 50 cooperative R&D consortiums in the U.S. Dozens of major corporations now have employee directors on their boards, and most big companies are developing various incentive systems to give their workers a piece of the action. Many large firms are experimenting with flexible structures that bring the entrepreneurial advantages of the free market into their own organizations. Similar moves are even appearing in China and the USSR, again simply out of necessity.

These and the other 40 major trends I've documented in *The New Capitalism* show that such ideas are slowly becoming a reality because executives are being forced to take steps that would have been considered unbelievable just a few years ago. I will admit this does not comprise a precise, inevitable forecast, but simply a preliminary guide that we will have to revise until it becomes more concrete about the year 2000. But it marks off the new territory ahead by showing how historic forces now being unleashed by a technological revolution are inexorably creating a new system of business and economics—a New Capitalism for the information age.

WILLIAM E. HALAL
The George Washington University
Washington, D.C.

He will say that "Allbase is the database we designed that will let us scale up to bigger systems. TurboImage won't be able to support the higher level of concurrency." Concurrency is the simultaneous access to a database by multiple users. Hoover won't assign a number to the users that TurboImage can support versus the expected numbers for Allbase. "Allbase is a new database with a lot of new code and different algorithms," he says. "To provide concurrency and relational access, we couldn't make it 100%" compatible with TurboImage.

Because "Allbase is more stringent in defining transactions," says HP's Whitney, "customers would have to define logic more clearly" than they do with TurboImage. That also affected the decision to offer customers a smoother migration path via TurboImage.

Utility Won't Be Offered

In the course of these findings, HP has altered one other Allbase strategy as well. It has decided not to offer a software utility called TurboWindow/XL, originally defined as the path to allow smooth migration of TurboImage applications to Allbase's HPImage portion. Customers will instead code into HPImage directly.

It will be a while, though, before anyone outside of HP has to worry about that. HP now is emphasizing the performance gains that can be realized today by moving TurboImage onto the Series 950 from the 70.

Despite the question marks, HP insiders feel that for the first time in a long time they can meet the competition head-on. "HP's been on the defensive," admits HP senior vice president Doug Chance. But he insists that's beginning to change: "The best is yet to come." ■

TERMINALS

Shaken by Price Erosion, 3270 Market Continues to Slide

Many users see more advantages in going to microcomputers, but a number of 3270 terminal manufacturers have counterattacked with new products.

TELEX'S FETTIG: "The 3270 is a mainstay of the American business community."

BY ROBERT FRANCIS

For companies that were said to have products about to be relegated to the scrap heap a few years ago, computer terminal manufacturers, particularly makers of IBM 3270-compatibles, have continued to show signs of life, even if the days of making easy dollars are over.

Conventional wisdom had computer terminal manufacturers ready to roll over and play dead as the price of pcs fell and took a chunk of the terminal market and forced terminal vendors to lower their prices. Though it's not possible to determine how much the market has been affected by the personal computer invasion, observers agree that the market for 3270 terminals has been slowing, if not declining.

According to Leslie Lord, senior research analyst at International Data Corp., Framingham, Mass., shipments of 3270-type terminals declined 7% in 1986, the first time the market has failed to show growth. Perhaps more important to note is that the value of those shipments declined to $957 million last year from $1.1 billion in 1985, a reflection of a decline in the price of the terminals.

On a more positive note, analysts say that while shipments are declining, the installed base of 3270 units continues to grow, meaning the replacement market will play an increasingly vital role for manufacturers. Price discounting is currently a staple of the 3270 market. At market leader IBM, for instance, the company is offering discounts on some models if purchased for delivery by the end of the year. One model in the discount program is list priced at $1,525 but is available for $1,395 under the program, an IBM spokesman reports.

Eyeing Price/Performance

For users, the advent of the lower-priced personal computer has certainly caused some reevaluation of the price and performance characteristics of the so-called dumb terminal, but not always to the benefit of the pc. A Dallas-based travel agency continues to use dumb termi-

Photograph by Steve Jennings

nals for their agents, who don't need the processing power of a pc. "We decided to use that approach because the agents don't need the memory or the disks," according to the agency's IS manager, "while at the next level, some of the managers do, and they can work on the pcs." Furthermore, many companies are worried that some workers with pcs can download company files into a single workstation and produce potential security problems.

For some companies, adequate safeguards, along with the other advantages of pcs, have meant the replacement of dumb terminals in IS departments. Steve Gleave, director of data services at Frito-Lay Inc., Dallas, says his company has only one terminal now and is using personal computers where data terminals had once been stationed.

In the next few months, maybe even years, 3270 terminal users may find themselves with more options, at lower prices, than they've seen in several years, while the manufacturers find themselves responding to a changing market dominated by a new, more aggressive IBM.

Many of the major terminal makers are already on this road, with new products and functionality. Most terminal manufacturers are adding processing functions to their terminals, creating in the process a hybrid product, the processing terminal. Beehive International in Salt Lake City, for example, recently introduced a family of machines with processing functions, such as record and playback, to offset some of the attractive characteristics of pcs.

Telex's Profit Streak Ends

Still, the road from a rapidly growing market to a maturing one is rocky, as several players, both large and small, have discovered. Tulsa, Okla.-based Telex Corp., which has steadily come in second in the 3270-compatible market behind IBM, has seen its seven-year string of profits snagged by changes in the market.

Telex, one of the few shining stars in Tulsa's beleaguered oil economy, wasn't caught unaware of these changes and, in fact, was readying a raft of new products, geared to shift revenue from the 3270-compatible market to new areas. But Telex officials disclosed earlier this year that those new products are taking more time to get off the ground than anticipated. That fact, along with severe price competition for the company's core products, in particular the 3270 compatibles, sent its stock into a tailspin and brought the formerly high-flying company to the attention of New York corporate raider Asher B. Edelman.

Last year, Telex's counterattack, consisting of voice data terminals, airline reservation terminals, and nine System 3X products, was designed to combat the expected revenue decline from the company's core computer terminal market. Two of the new products for the company's new airline systems automation line include the 078-A terminal with a 12-inch display and the 080-A with a 15-inch display. Earlier this year, the company announced some other new products, including a diskless personal computer, designed to counter the pc trend.

Meanwhile, Telex officials are still positive about their presence in the 3270-compatible market. "The 3270 is a mainstay of the American—and worldwide—business community," says Dick Fettig, director of marketing at Telex. "So it's going to be around even though the growth rate isn't going to be as fast as it had been. I think the pc revolution went unchecked for a while and the thing began to erode, but that's sort of been addressed by these new products."

Others also see Telex's introduction of new products as a positive move. Joe Wagner, an analyst for Dataquest, a research firm in San Jose, says the company is responding to the changes in the marketplace. It may just take some time, however, for the new products to get off the ground, he says.

Telex and Beehive are

3270 Terminal Shipments Decline

	UNITS (IN THOUSANDS)	DOLLARS (IN MILLIONS)
1985	670	1,145
1986	624	957
1987 (est.)	589	829

From Role Model to Takeover Target

During the oil-fueled economic boom of the late 1970s and early 1980s, Telex Corp.'s revenues and profits were a mere blip on the economic screen of Tulsa, Okla., where companies involved in the oil and gas business overshadowed the computer terminal manufacturer.

Telex, however, became an important example of a successful, diversified company in the local economy, but now many are worried about what will happen to Telex since the company has become a takeover target of New York investor Asher B. Edelman.

Telex has found itself a takeover candidate not because it has been unsuccessful or unprofitable, but because it has been buffeted by two forces: severe price competition in its core, 3270-compatible market, now mature; and new-product snafus. Shipments of new products (System/3X offerings and airline reservation terminals) have not met expectations and the cost of development has been higher than anticipated, company officials say. In early September, the company announced that because of these problems it was slashing its earnings estimate for its second quarter ended Sept. 30, which sent its stock plummeting.

At that point, Edelman, currently chairman of two other computer companies he had previously purchased—Datapoint Corp. and Intelogic Trace Inc., both in San Antonio—entered the scene and offered to purchase Telex for $870 million. At press time, Telex's board of directors had deferred a recommendation on Edelman's offer and had authorized management to seek other alternatives.

If Telex attempts to do battle with Edelman, it could benefit from some laws passed in Oklahoma following takeover artist T. Boone Pickins' attempt to gain control of Phillips Petroleum Co.

At press time, Telex's second-quarter earnings were not in, but the company had cut its earnings projection to about $14.6 million, down from an earlier projection of $21.9 million. In the same quarter last year, the company had a net income of $19.4 million on revenues of $204.9 million. For the fiscal year ended March 31, the company reported a net income of $77.2 million on revenues of $840.7 million.

not the only companies in this market to develop a new thirst for battle. "IBM introduced more new 327[illegible] products in the past year than in the whole of the previous 10 years," says Dataquest's Wagner.

Last year, IBM introduced the 3191 terminal to replace the 3178 terminal. The 3191 has several new features, including an improved display, keyboard, and an optional three-year warranty.

HP Backing Terminals

Despite the shrinking 3270 market, at least one other company still sees profit potential in the terminals. In August, Hewlett-Packard entered the fray with its own line of IBM-compatible terminals. Previously, HP had manufactured terminals for its own systems, but recently decided to tackle the 3270-compatible market as well, introducing the HP 700/71 for that market. Says an HP spokesman, "When we go in to sell our own terminals, companies typically don't just use one system, they have a DEC or an IBM as well as a Hewlett-Packard. This way we can provide a full range of terminals."

In terms of market share, IBM has generally held between 55% and 65% of the market for 3270 terminals, with Telex coming in second with slightly more than 15%. Next up is Courier in Tempe, Ariz., with about 8%, then AT&T-Teletype with 5%, followed by, in descending order, Memorex, Lee Data, and Harris, then other, various smaller players, holding between 5% and 6% of the market.

How these numbers may change, if at all, over the next year is anybody's guess, but one thing's for sure: the 3270 world is still a fact of life for many IS shops and will continue to be so for some time to come. ■

STANDARDS

DOD MAP Blessing Aids Business Sector

The government's GOSIP standard should be approved in '88, leading to a rush of vendor compliance.

BOEING'S BRIDE: GOSIP will be the standard for procurement.

BY WILLIE SCHATZ

After three years of a thousand million questions, MAP/TOP (Manufacturing Automation Protocol/Technical Office Protocol) is suddenly in so deep with the in crowd that the government has developed its own version.

Usually, that spells trouble. In this case, it may mean just the opposite.

"GOSIP [Government Open Systems Interconnection Protocol] is the most significant thing to happen in the last three years," Laurie Bride, TOP program manager for Boeing Computer Services, Seattle, said at the recent MAP/TOP Users Group meeting in Dallas. "It's industry and government working together toward a common goal—interoperability."

The goal may be the same, but for a while the specifications weren't. The first draft of GOSIP was not aligned with TOP. Enter the National Bureau of Standards (NBS) Implementors' Workshop, a combination of government and industry computer experts. Spurred by the MAP/TOP group's desire to have as much interoperability as possible available for the Enterprise Networking Event '88 International (ENE '88i), at which the latest in MAP 3.0 products will be shown, the workshop spent many hours trying to reconcile the differences between TOP and GOSIP to ensure that they would be identical. It was a rough job, but someone had to do it.

Guess what? They did. GOSIP is now a clone of TOP. Every one of the seven ISO layers is the same. But the government, true as always to its bureaucratic principles, had to give TOP another name because not to do so could have been viewed as endorsing a private sector standard. The private sector could care less. A contract by any other name is still a contract. Now that the government—the Department of Defense (DOD) in particular—has adopted GOSIP as its standard, there will be plenty of signings on the dotted line.

"GOSIP will be the standard for government agency procurement," according to Bride of Boeing. "It will become mandatory in the DOD within two years. At that point all DOD agencies will be allowed to procure only GOSIP-conformant products. So if vendors don't start making products to conform to the GOSIP standard, they won't be able to do business with the world's largest user."

A Private Sector Phenomenon

For a while it appeared that would be the scenario with or without GOSIP. Business hasn't exactly been booming up to this point. MAP/TOP has been mostly a private affair, with the government on the outside looking in. That's more a matter of the myriad bureaucracies in Washington not being able to get it together than a lack of desire to get involved in the MAP/TOP movement. If the private sector's computers can't talk to each other, imagine the linguistics problems in the government's systems.

The civilian agencies actually have been signing up for MAP/TOP at a reasonably brisk rate. That mattered little without the concurrence of DOD, which, as all those feeders at the government trough know, is the largest user with the most money.

DOD was unwilling to commit itself to GOSIP until users

Photograph by Doug Wilson

Midrange Shootout:

A revitalized IBM, the Intel 386 micro, MS/DOS, PS/2, and Unix are the big winners in DATAMATION'S latest mini/micro survey. But the real action could come in a showdown pitting hot new workstations and pcs against minicomputer traditionalists.

BY RALPH EMMETT CARLYLE

IBM, whose small and midrange systems have been wounded in recent years by clones and VAXs, may be on the mend. Big Blue appears to be the prime beneficiary of a resurgent demand in 1988 for small and mini-based systems. Sun Microsystems and Tandem also stand to grow more formidable next year as customers expand their workstation and online transaction processing applications.

These are among the trends that emerge from the 1987-88 DATAMATION/Cowen & Co. Institutional Services mini/micro computer survey, comprised of nearly 7,000 responses from U.S. end-user organizations—the largest known sampling of its kind by any business magazine or brokerage firm.

A number of trends point to a significant event: a showdown pitting workstations and pcs against minis. Projected workstation shipments alone could grow an impressive 36.3% in dollar value during the 12-month period ending June 1988. (The survey defines workstations as powerful single-user or multiuser desktops, generally selling for over $5,000 each.) The corporate pc market also will accelerate significantly over the same period, with unit growth climbing 23% during the year—much steeper than last year's 16% trek. The rapidly maturing minicomputer segment—collectively, the small business system, office system, and traditional mini—could experience a growth spurt of just under 10% during this period.

This year's survey sheds some welcome light on many controversial industry topics. Where IBM is the principal pc supplier, the survey finds that over 50% of respondents will embrace the PS/2 family of machines. But it's clear that two software standards, MS/DOS and the PS/2

Illustration by Andreas Bonfiti

Mini/Micro Survey

operating system, OS/2, will coexist for many years to come. That's because of the perceived "proprietary" nature of IBM's upcoming version of OS/2 extended edition and its Micro Channel bus.

IBM's new 370-compatible mini, the 9370, has been tagged the "VAX killer," but it has hardly nicked Digital Equipment Corp. to date; only IBM's very largest customers are interested in it so far, and the survey shows that only one of every eight that are evaluating the 9370 currently has plans to buy it. Next year, however, interest in the 9370 is expected to pick up—so much so that it could provide 30% of IBM's midrange revenues in 1988. IBM has begun to ship the machine in volume: 5,000 units worldwide in this quarter alone, insiders say, and considerably more next year. However, the 9370 does not appear to be attractive to more than a small fraction of DEC's customer base at this time.

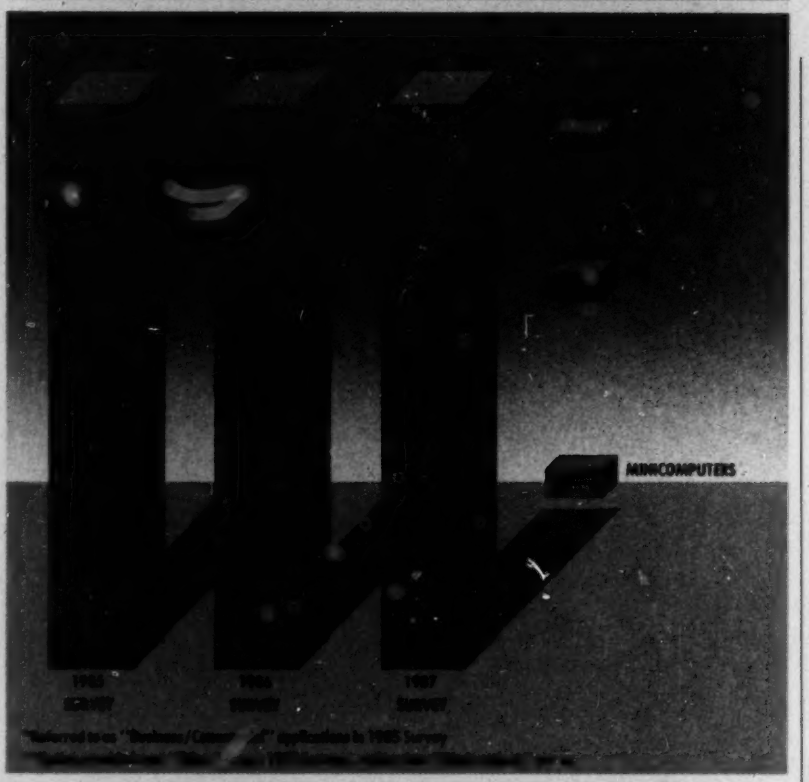
Other "hot" industry topics are proving more mythic than real at respondent sites. For the second year in a row, the AI language Lisp failed to make any headway. There was also no growth from a year ago in the adoption of multiple or parallel processing machines—the "minisupercomputers." It's not clear whether the absence of a surge in minisupers results from a lack of confidence in the handful of startups, such as Convex and Alliant, that inhabit this sector or from the dearth of compilers that make these new architectures completely transparent to programmers. Once this bottleneck is removed, it would appear likely that this embryonic industry segment will grow rapidly.

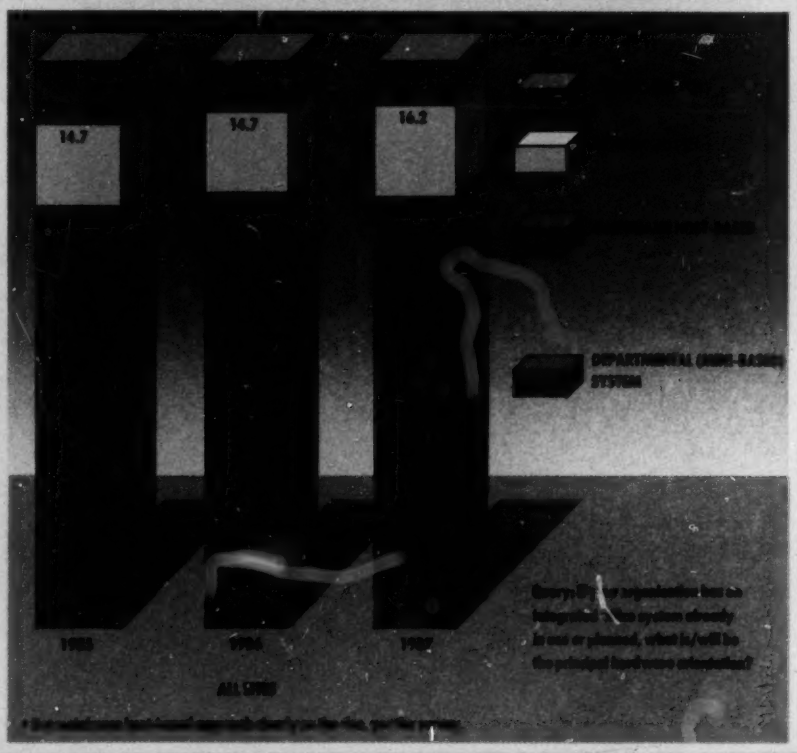
Sun, Tandem Receive Good News

Several companies emerge from the survey smelling like roses. In general, Sun Microsystems, based in Mountain View, Calif., and Tandem, in Cupertino, Calif., seem to be the most improved. DEC was tops in customer satisfaction. In pc market share, Compaq managed to consolidate its strong number two position behind IBM.

Other companies send off mixed scents. Apple, for example, doesn't show any progress in personal computer unit shipments. Its share of the 143,000 machines to be shipped between July 1987 and December 1988 remains at 7%, the same percentage it had of the 123,000 pc shipments between July 1986 and December 1987. In Apple's favor, the number of sites buying its machines is climbing: 7% today compared with 5% a year ago.

Data General, Wang, and AT&T are suffering from severe credibility problems (see "Keeping the Faith"), according to the survey. The trio must reestablish themselves in the market-





place. The same cannot be said of Hewlett-Packard, despite strong public criticism of its ambitious—and delayed—Spectrum program. The company's reputation and customer loyalty are apparently undiminished. Spectrum, especially as a Unix machine, is expected to be a strong player in the market. Hewlett-Packard, like Data General, is going back to its roots—courting oems and vars with aggressive price discounts. HP sees such alternate sales channels as major sources of future growth.

Despite DEC's stellar reputation with customers and its increasing share of the commercial minicomputer market, there are some ominous portents for it in the survey. The mini maker's oems and vars have grown dissatisfied with DEC's discount structure and its insistence on proprietary technology; their loyalty can no longer be taken for granted. DEC's preference for its homegrown VMS operating system is hurting it in workstation markets, in which, as the survey reveals, Unix has become a virtual standard and Sun Microsystems, not Digital, is the new leader.

Overall, there is a sense in the survey that even though DEC is now at the pinnacle of its success and seemingly untouchable, the company may yet become a victim of the pattern of growth and change that helped bring it to such prominence: the evolving trend of distributed processing.

The spending outlook is substantially better for pcs and workstations than it is for minis; DEC, however, has failed to make the transition to mainstream pc supplier. The survey reveals that only 2.7% of its own VAX customers will get their pcs from DEC; over 44% of their pcs will come from IBM during the 18-month period ending December 1988. As DEC continues to lose substantial dollars to noncaptive pcs, two questions arise: how long can DEC continue to forego the revenue opportunity of supplying its customers with attractively priced and featured pcs? (the company's VAXmate clearly doesn't fit the bill—only 35 sites intend to buy DEC's pc-compatible offering next year, whereas 55 sites expressed a willingness to buy it in last year's survey); and how can DEC justify spending heavily to remain compatible with IBM's emerging PS/2 standard—a drain from VAX R&D?

Unfortunately, as DEC prepares to meet this micro challenge, it's clear that the reservoir of new minicomputer users is drying up: there was only a 5% increase in new sites this year compared

with the 12% compound growth rate in the minicomputer population over the past eight years. So, while the shipment outlook for minis has improved in 1988 (and one shouldn't underestimate IBM's contribution), the long-term outlook is not so good.

Pcs Advance in Distributed Processing

Pcs are taking a bigger bite out of declining MIS budgets, and are beginning to replace minis as the preferred small systems vehicle for distributed processing. This trend is most apparent in the commercial arena. Figure 1 shows that the pc, at 61.5% of the sampling compared with the mini's 26.8%, is the overwhelming choice of IS managers and other respondents for their new office and MIS applications.

Figure 2 reveals a picture even more alarming for DEC. At these respondents' sites, pcs are creating an

WORKSTATION SHIPMENTS COULD GROW 36.3% IN DOLLAR VALUE.

increasing demand for mainframe-based services. This is something IBM has hoped for all along but hasn't been able to make happen because of its inability to offer the necessary database and communications links between the two. Now, with the advent of the PS/2, IBM has begun to supply such connectivity as part of its emerging Systems Applications Architecture (SAA) blueprint. IBM's growing network presence points to this trend: Big Blue is expected to double its share of planned LAN installations to 12.4% (see Figure 3).

Some of IBM's largest customers believe that as an increasingly intelligent network emerges between pcs and mainframes, a middle, or third tier, of minicomputers can become superfluous. IBM executives claim that half of the company's customer base has chosen this two-tier route, and this trend is certainly evident in Figure 2, from which it seems apparent that mainframes are beginning

FIGURE 3 Formidable LAN Suppliers Confront the Independents

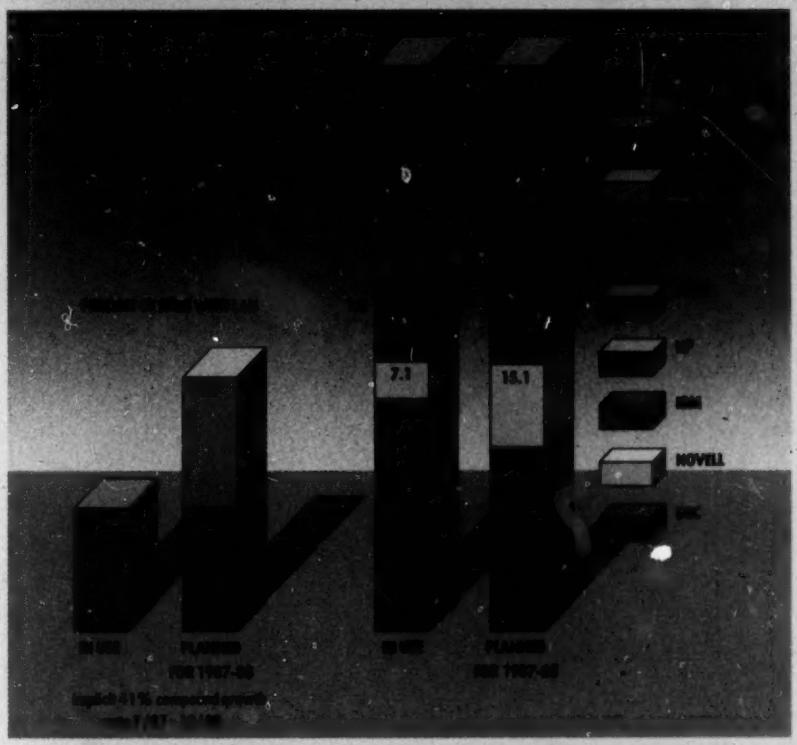


FIGURE 4 Unix Uniformly Gains as Primary, Secondary OS

FIGURE 5 DEC Share of On-line Transaction Processing Market Improving Decidedly, Despite Lack of Product

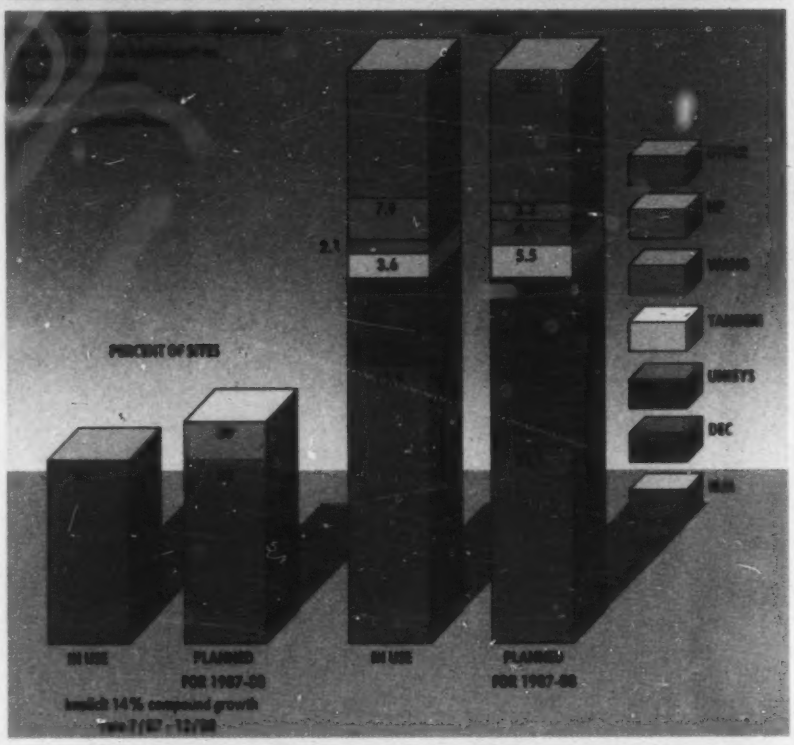
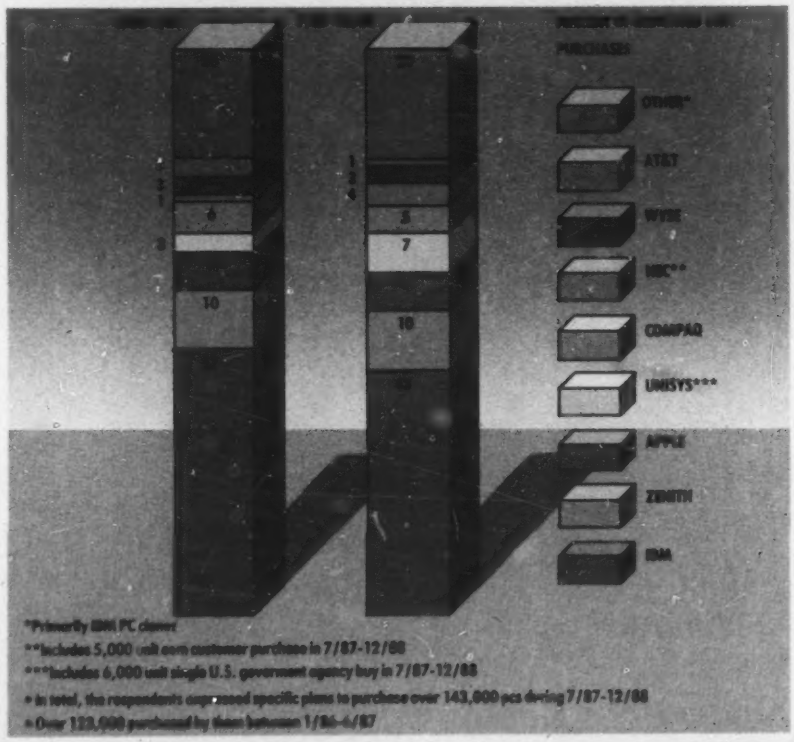


FIGURE 6 Distribution of Respondent Pc Unit Purchases



to replace minis as the host vehicle for new integrated office applications.

Future DATAMATION/Cowen & Co. surveys will show whether this two-tier phenomenon spreads beyond new MIS/office applications into technical and scientific markets. While customers in these markets are emphasizing dedicated engineering workstations over minis for new applications, they are also employing pcs to a greater degree than ever before. Compaq, which reinforced its strong number two position behind IBM in the pc survey, is already boasting that its new Intel 386-based machines have been benchmarked at whetstone levels comparable to workstations from Sun, Apollo, and DEC.

The other issue that DEC's management faces is the increasing adoption of Unix as the portable OS standard for

IT'S CLEAR THAT MS/DOS AND OS/2 WILL COEXIST FOR YEARS TO COME.

small and midrange systems (see Figure 4). By the end of 1988, 14.5% of DEC's customers will have some flavor of Unix as their primary operating system, and 21.2% will have it as their secondary choice. As these customers aren't effectively "locked in" to DEC's proprietary technology, they will provide fair game for competitors. In fact, one major reason for IBM's support of Unix is that it provides an entrée into DEC's technical market and its customers.

DEC, of course, is not sitting still while these threats materialize. If the mini maker is losing its grip in some markets, it can always gain a foothold in new ones; if IBM can gaze hungrily at the VAX world, DEC can in turn target the mainframer's own customers. Tandem, which recently broke through the $1 billion a year sales barrier by selling distributed on-line transaction processing (OLTP) systems to IBM's customers, has provided DEC with the perfect precedent.

As Figure 5 shows, DEC's customers now are widely anticipating the

FIGURE 7 End Users Spending a Half Hour More a Day on Their Pcs

announcement in the near future of a VAX-based OLTP challenger. DEC is expected to capture 24.6% of the respondent sites implementing OLTP systems during the survey period, up substantially from the current 6.6% level. IBM's share is projected to decline to 33.9% of the total from 48.5%, which perhaps explains the company's increasingly aggressive marketing of the Stratus fault tolerant OLTP system, which Big Blue calls the System/88.

DEC sources indicate that the company's creation of a new I/O-intensive VAX architecture for OLTP should result in a product next year. Survey respondents are demanding fault tolerant capabilities on this machine, and one must assume that DEC will accommodate them.

Since DEC's fortunes have soared in recent years while IBM's have declined, it's perhaps to be expected that when the industry leader did make a comeback it would be at DEC's expense. John Akers may, in fact, be taking business from Ken Olsen. Then again, the IBM chairman may be taking it from the likes of Edson de Castro, An Wang, and other executives

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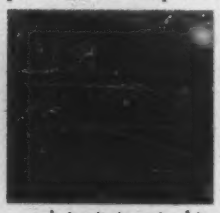

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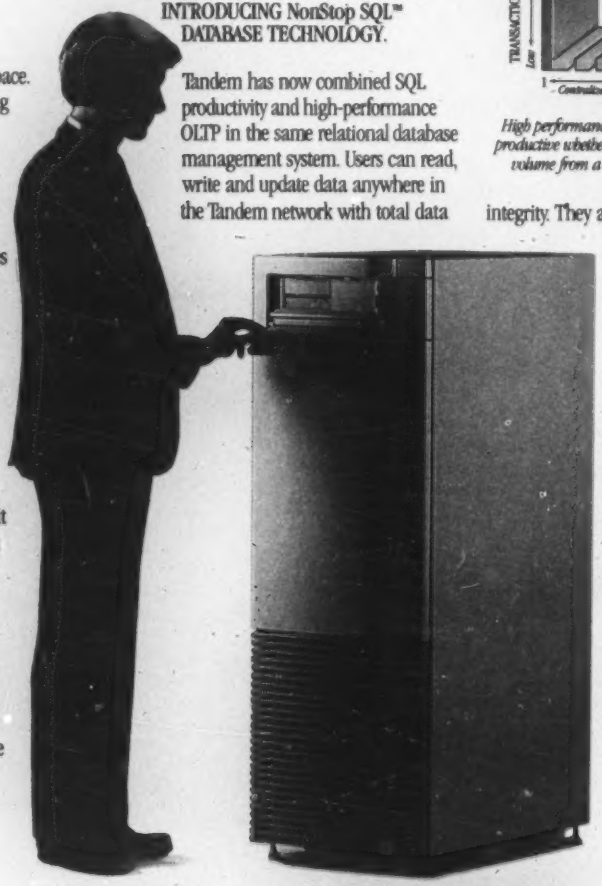

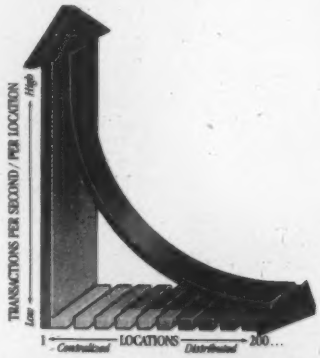

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of second-tier computer vendors. The answer depends on how this year's survey data are interpreted.

IBM's Fortunes Changing in Minis

In recent surveys, IBM has been a poor second to DEC in projected spending for minis and workstations. In stark contrast, this year the mainframer could grab the lion's share of all dollars that respondents expect to spend on such systems over the 18-month period ending December 1988—if one counts a humongous IBM mini order from the U.S. Postal Service, one of the respondents to the survey. Including the postage stamp, the survey projects that IBM's share of total mini/workstation dollars will be 35.6%, compared with DEC's 33.1%. IBM, with its System/88, System/36, and 9370, has three of the top six dollar earners in this category.

If, however, the Postal Service's response is put in the dead letter file, IBM's resurgence in minis will come at the expense of vendors that can least afford competition from Big Blue—Wang Labs, Data General, and others. Excluding the postage stamp, the portion of mini/workstation spending that will go to IBM is expected to increase to 18.2% from 14.7%. But Big Blue's bigger bite clearly won't come out of the hides of DEC, Hewlett-Packard, Sun, Prime, or Tandem.

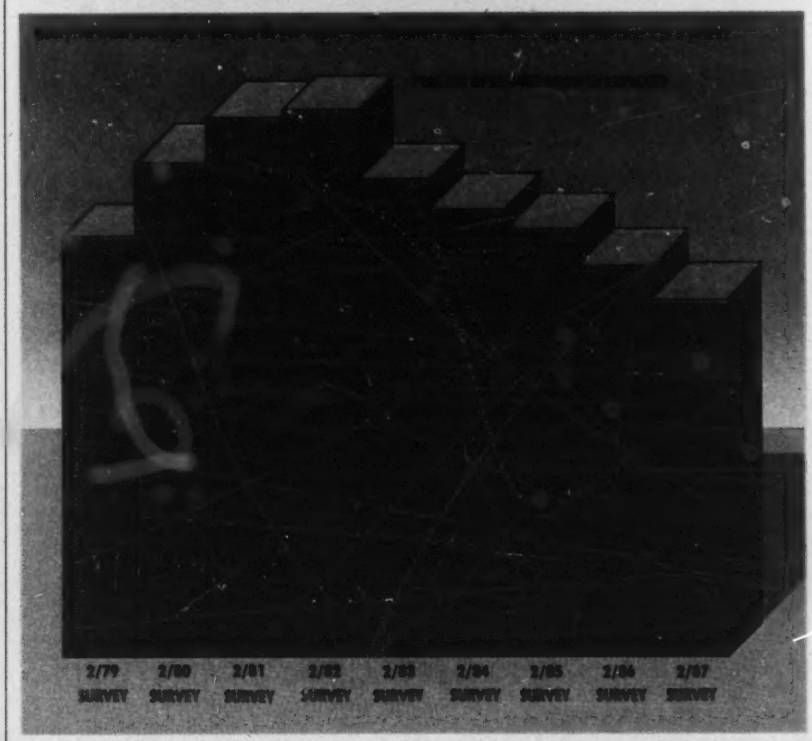
Not surprisingly, IBM's projected share of the pc pie over the same 18-month period is even more pronounced. Of the 143,000 pcs that respondents expect to purchase between July 1987 and December 1988, IBM is projected to supply 43% of them (see Figure 6; IBM insiders now claim that there is a 160,000-unit backlog of PS/2 orders from its largest customers, with names such as Ford, United Airlines, Travelers Corp., and Merrill Lynch). The other portions are primarily held by IBM PC clones, with none having a share greater than 10%. DEC, of course, is not a factor in this table.

DEC's share of minis planned for use in scientific, engineering, and factory applications will decline to 53.9% from 59.7%. The big gainers here are Hewlett-Packard, Sun, and IBM, though none had more than 10% of the market.

DEC is still the big winner in office minicomputers. Its share of total dollars over the 18-month survey period is projected to grow to 29.4% from 22.4%, while IBM's share declines to 21.9% from 27.4%. A growing number of respondents are turning away from minis for office/MIS use, preferring instead a com-

FIGURE 8 MicroVAX Leads Top 12 Systems to be Acquired

FIGURE 9 Continuing Decline in Long-term Hardware Budget Growth Expectations



DIGITAL CAN NO LONGER TAKE OEMS' AND VARS' LOYALTY FOR GRANTED.

Keeping the Faith

Today, minicomputer suppliers are in a situation similar to the one that developed a generation ago in the mainframe industry. Digital Equipment Corp. and IBM are putting distance between themselves and other mini suppliers in the same way that IBM sped away from the mainframe pack in the late 1960s. It's not the BUNCH being left behind in the mini race, but a new cast including Hewlett-Packard, Prime, Wang, Data General, and AT&T.

IBM and DEC are to take almost 70% of the dollars respondents spend on minicomputer and workstation products in the June 1987-December 1988 period, according to DATAMATION/Cowen & Co.'s latest mini/micro survey. Just five years ago, IBM and DEC accounted for 53% of the mini purchasing power of end users surveyed.

The gap between the leaders and the laggards has widened gradually in some cases and precipitously in others. Hewlett-Packard, for instance, shows no erosion in its 5.3% market share between the previous 18-month stretch and the current one. Prime suffers a drop between the two buying periods to 4.7% from 5.3%, Wang tumbles to 3% from 9.2% and Data General slips to 2.3% from 3.4%; AT&T nearly disappears off the horizon. (The telecommunications giant acknowledges that its guns were silent for a 20-month period between 1985 and 1987, but it claims that almost 70% of this year's revenues are from products that are less than a year old. Even so, insiders don't expect AT&T's Data Systems Div. to break even until 1989.)

Tracking the actual models that customers expect to buy, Figure 8 shows this shrinking minicomputer universe in another light. Six vendors supplied the top 12 minis based on the number of respondents acquiring systems in the survey period January 1986 through June 1987. That number is down to four; by dollar value, only IBM and DEC are visible. Almost half of all sites polled say that they now consider only one supplier when making their minicomputer purchase decision.

Add to this the fact that IS budgets continue to grow at ever smaller rates—less than 8% in 1987 compared with the 11.8% reported in 1982 (see Figure 9)—and the mini BUNCH has a major headache.

If you go into greater detail, these companies' outlook is even gloomier. In office/MIS, the biggest market of all for minis, the survey projects Wang's share will decline to 7.6% from 12.1% and Data General's to 4.8% from 7.8%, with Prime's share staying about the same. Other than DEC, only Hewlett-Packard will gain ground, climbing a single percentage point to 6.2%.

In the other large market segment, scientific/engineering/factory, Data General and Wang are nowhere to be seen, and Prime will eke out a tiny 3.1% of the pie, in what is that company's major market segment. Here, all the mini makers are losing out to the workstation and to Unix. Only Hewlett-Packard, with its increased Unix/workstation orientation, is making progress in this sector among the mini BUNCH: its share could rise to 9.7% from the 4.3% in last year's survey.

In the highly competitive and fast-growing workstation sector, again, only Hewlett-Packard is expected to uphold the honor of the mini BUNCH, doubling its share to 10%. The rest are in the category of "other," as Sun, Apollo, and, of course, IBM and DEC, dominate the scene.

If the pc is set to become the workstation of the future in all markets, then once more it's a future in which the mini makers will play little role—if any—building, and here, even the mighty DEC must be included. Only Wang and Hewlett-Packard have had any success in selling homegrown pcs to their own customer base. DEC and Data General (despite the huge marketing push behind its portable computers) have been notable failures.

Even more depressing, in a sense, is the mini makers' performance in the high-growth sector of integrated office automation systems, a segment where so many of the mini BUNCH have tried to make a stand, and which has been the cornerstone of both Data General's and Wang's reputations. All mini makers—including DEC—are losing out to IBM and to an increasing two-tier blend of pcs and mainframes.

The projected erosion of Data General's base is the most spectacular. The company's share could decline to 6.6% from 13.5%; Wang's to 6.8% from 7.9%. Again, only Hewlett-Packard is expected to increase its share a touch. These depressing statistics perhaps explain why Data General seems to be embarking on a new strategy of courting oems, vars, and systems builders, rather than end users—a return to its roots. The survey shows that along with Hewlett-Packard, DG is offering huge price concessions to these middlemen in an attempt to shift its strategic course. Of course, as the survey makes plain, oems are a fickle bunch and are even turning on DEC.

All in all, there is the impression that these companies, with their proprietary technology and large installed bases, are giving way to a new industry standard platform for applications development: a combination of the Intel 386 (the overwhelming first choice micro in the survey), MS/DOS, and, increasingly, OS/2 and Unix—predominantly AT&T's flavor. Prime is trying to meet this trend with its new supermicro, the EXL 316: a combination of the Intel 386, DOS, and Unix. Based on the principle "If you can't beat 'em, join 'em," Hewlett-Packard is primarily succeeding with Spectrum as a Unix machine.

Overall, however, the mini makers, perhaps overwhelmed by the rate of evolution to micros, are seeking the sanctuary of their own base, and of mainstay high-margin products. This is reflected in all of these companies' shipment projections.

Around 47% of Prime's dollars will come from its high-end 6350 (up from 16%), a product that typically sells for an average of $450,000. Likewise, almost 57% of Wang's dollars will come from a single high-end product—its $380,000 VS7000. More than 55% of Data General's revenue from respondents will come from its high-end MV 15000, only this time the average purchase price for this machine—$150,000—is not as high as the other New England challengers' entries. The same principle seems to apply for Hewlett-Packard as Spectrum ramps up. Its aging 16-bit 3000 series family will decline to 42.4% of its total from 72.5% as Spectrum grows to almost 31% from virtually nothing.

To succeed in the future, these companies will have to do more than retrench into their own customer bases, offering products that are increasingly like mainframes. They will have to convince everyone that the mini can play a vital, vibrant role in the industry's evolution. They will have to prove that the hemorrhaging of applications to micros can be checked. Clearly, the jury is still out on the eventual outcome of these efforts.

Survey Method

The 1987-88 DATAMATION/Cowen & Co. mini/micro computer survey began July 13, 1987, when close to 70,000 questionnaires were mailed to DATAMATION readers throughout the United States. The survey audience was selected on the basis of whether minicomputers, small business systems, or micro-based systems were purchased or in use at a given site.

Replies, collected through Aug. 24, yielded 6,589 qualified, unduplicated responses. Cowen & Co., a Boston brokerage house, tallied results, analyzed data, and presented its findings to institutional investor clients on Sept. 29.

The survey defined minis as including cpus such as the DEC PDP-11, MicroVAX, and VAX 8XXX lines, and comparable systems from Data General, IBM, Hewlett-Packard, Prime, Tandem, etc.; minisupercomputers; mini-based departmental and small business systems; office systems; and workstations. The latter are single-user or multiuser desktop systems, generally priced above $5,000 each; typical examples are products from Apollo, Sun Microsystems, and the IBM RT PC and PS/2 Model 80. Pcs are single-user systems, desktop or portable, including the Apple II and Macintosh, IBM PC and PS/2, and Compaq. To order the complete survey results, please call Debbie Virtue at (617) 964-3030.

FIGURE 10 Vendor Selection Rests on Quality/Reliability

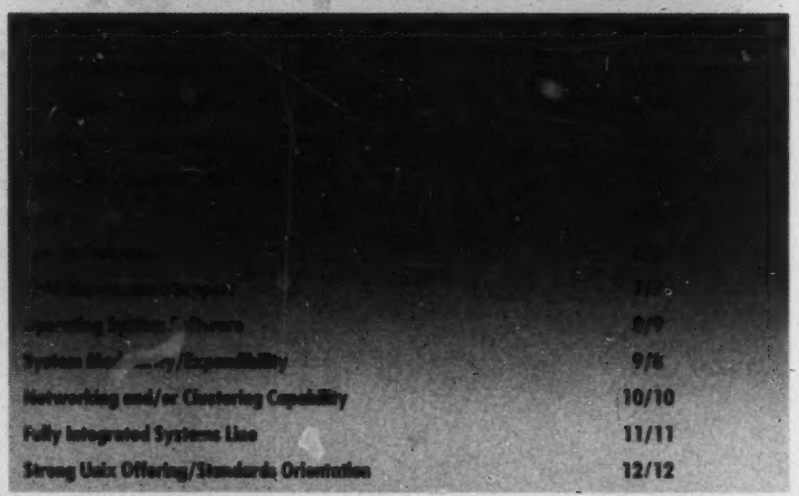


FIGURE 11 Key Criteria For Selecting A Pc Supplier

*Each respondent asked to specify no more than three criteria.

†Includes hardware availability, ease of use, expandability/upgradability, government/company contract, size/portability, graphics display, memory/disk capacity, etc.

bination of mainframes and pc/workstations.

In the highly competitive workstation business, DEC stands to receive 22.3% of the total dollars, an increase over last year's 18.9%. The big winner in this category, however, is Sun Microsystems; its share could leap to 24% from 15.3%. Other gainers are HP and IBM, while Apollo's share is expected to decline to 10.5% from last year's 12.4%.

Personal computers and workstations are becoming the machines of choice for many applications that were once performed on traditional minicomputers, as previous surveys have shown. Respondents now claim that pc applications packages are of a far higher quality than mini-based equivalents; it should be

UNIX PROVIDES IBM WITH AN ENTRÉE INTO DEC'S TECHNICAL MARKET.

stressed, however, that pcs are still essentially two-application machines—spreadsheets and word processors—and there are no signs in the survey of any revolutionary new applications coming along to drive the market to the triple-digit growth levels that once characterized it. DBMS, cited by nearly 14% of the respondents, is emerging as a major application for the new pcs. Also showing potential is electronic publishing: some 6% of applications packages will be used for this purpose. A significant "other" is computer aided design.

One of the most interesting statistics unearthed by the survey is shown in Figure 7: the increasing amount of time that people are spending in front of their pc screens. Since 1984, the average has grown to 5.6 hours a day from 4.9. With such habitual use of a crt, one has to wonder whether a resurgence of demand for home computers is just around the corner. Clearly, if some innovator can come up with exactly the right blend of price, function, and friendliness, what is potentially the biggest small systems market of all is ripe for the plucking. ■